

Applicant : Eng Shi ONG
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2. Indistinct claiming (§ 112): Objection has been raised under 35 USC 112 against Claims 1 - 20 for employing the term "dynamically" "as being indefinite for failing to particular point out and distinctly claim" the invention. Specifically, it has been alleged that "it is unclear what is meant by the term" and "how does that term limit the invention and differentiate the invention from another that contacts an analyte with water at a regulated pressure.

2.1 "Dynamically" (as compared to "statically") refers to the flow rate of the sample or source material in which analytes are to be extracted from. Dynamic or static process flow is a basic dichotomy of categorising chemical processes, which generally corresponds to "continuous" (i.e. running flow of source material) or "batch" (i.e. static or fixed volume of source material) process flows respectively. Both terms are well-known in the art.

2.2 To illustrate the well acceptance of the terms in the art, applicant may even refer to Prior Art A cited by the Examiner, i.e. US-6,524,628 (Wai), wherein both terms were employed in describing its process flow. Specifically, Wai mentions that its method for exposing a plant sample may be performed "statically, dynamically, or both" in the Abstract and elsewhere in the specification, i.e. at column 1 line 51, Claim 8 (column 16 line 19 -21); Claim 53 (column 18 line 65); and at column 3 line 44 (description of Figure 7).

2.3 Accordingly, applicant maintains that the term "dynamically" used in the claims is clear to a person skilled in the art as continuous flow or feed and is distinguishable from "statically" or batch processing.

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2.4 While "dynamically" would conjure up flow of source material and hence the need for flow rate to be defined, it should be noted that this is not a salient or essential feature of applicant's invention to warrant defining a specific value therefor in Claim 1. It is intended only to distinguish from processes that are static. As pointed out by the Examiner in paragraph 7 of the Office Action [in raising 103(a) objection which the applicant shall deal with later] that the "time and concentration" may be selected by, and is obvious to, a person having ordinary skill in the art. As such, the applicant's claimed inventions' flow rate is claimed only in Claim 16, which is 1 ml/min.

3. Lack of Novelty (§ 102): The Examiner has cited Prior Art A - US-6,524,628 (Wai), under 35 USC 102 as anticipating applicant's invention. In particular, it is alleged that Wai's method includes, *inter alia*, contacting sample with water below 100°C and at a regulated pressure from about 25 to 100 bar.

3.1 Applicant admits that the temperature range of below 100°C claimed in the invention is anticipated by Wai. However, applicant maintains that the pressure range of 10 to 30 bars is novel over Wai for the following reasons.

3.2 Wai's pressure range of 25 - 100 bar is only mentioned in passing in the specification and is not supported by specific examples or description elsewhere. In fact this overly broad range is in contradiction with the other more structured or specific disclosures such as "at least about 50 atm" at column 2 line 63, with "100 atm being the most cited and supported pressure.

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3.3 Without conceding the correctness of the Examiner's position and to expedite the prosecution of this case, applicant would nevertheless amend Claim 1 in the following manner, i.e. by -

3.3.1 inserting a hyphen between "analyte" and "containing" to indicate the compound words' use as an attribute or adjective to the noun "sample"; and

3.3.2 by amending the pressure "30" bar to "25" so that the pressure range is narrowed to "10 to about 25 bars" in Claim 1

as shown in tracked changes in the following:

1. A method for water mediated extraction of analytes from a sample, said method comprising dynamically contacting an analyte-containing sample with water below 100°C and at a regulated pressure from about 10 to about ~~30~~ 25 bars.

3.4 With this restriction, applicant's method is not anticipated by Wai and is therefore patentable over this cited art.

3.5 Accordingly, with this new restriction of the essential feature of pressure, applicant's invention is novel and remains patentable over Wai when considered in combination with the other preferred features comprising the use of organic solvent, aggregate (sand) for contact or surface area dispersant, detection by gas chromatography and flow rate as raised by the Examiner in paragraph 4 of the Office Action.

4. Obviousness (§ 103): The Examiner has also raised obviousness objections under 35 USC 103 based on the aforesaid Prior Art A (Wai) in combination with one or more of

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- 4.1 Prior Art B, i.e. US-4,176,228 (Hartung);
- 4.2 Prior Art C, i.e. US-6,511,601 (McMurtrey) and
- 4.3 general state-of-art.

5. Claims 10 and 12 have been rejected under 35 USC 103(a) as being unpatentable over Wai. Claim 10 is directed to extraction contacting time period from about 20 - 40 minutes while Claim 12 is directed to organic solvent concentration from 5% to 30% in increments of 5%. Whilst applicant agrees with the Examiner's contention that varying the amount of time of contact and varying the concentration of solvent would have been obvious to a person having ordinary skill in the art, applicant wishes to point out that, with the amendment of Claim 1 above which narrows the pressure to a range of 10 to 25 bars, it would not be obvious to skilled person to achieve applicant's invention even by varying said contact time and solvent concentration.

6. With regard to the objection against Claim 14 which is rejected under 35 USC 103(a) as unpatentable over Wai in view of Hartung, applicant concurs with the Examiner's finding that Wai lacks disclosures on analytes of berberine, baicalein or glycyrrhizin which are covered in Claim 14. However, applicant disagrees that Hartung discloses a method for extracting glycyrrhizin with water at a temperature and pressure that is within obvious consideration by a skilled person.

6.1 While Hartung's temperatures range from 20°C to 150°C may overlap with applicant's range of 30°C to 100°C, Hartung's suggestion of "Pressures above atmospheric may be used" at column 3 line 31 (as noted by the Examiner) is highly speculative since this suggestion is not supported anywhere

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else in the specification. In fact, the word "pressure" does not appear anywhere else in the specification.

6.2 In fact, there are indications in Hartung that normal atmospheric pressure is used when both the processes of

6.2.1 acidification of alkaline extract [column 3 line 54]; and

6.2.2 alkalification of glycyrrhizic acid [column 4 line 21]

are described with "no special conditions" except for the respective preferred temperatures.

6.3 A skilled person combining Hartung with Wai would arrive at the understanding that a pressure of at least 50 atm would be required for the extraction process to work. Accordingly, applicant asserts that Claim 14 is not rendered obvious by Wai in view of Hartung.

7. With regard to the objection against applicant's Claims 18 - 20 as being rendered obvious by Wai in light of McMurtrey, applicant wishes to point out that while their said claims are directed to the water solvent composition as containing surfactant or detergent, including sodium dodecyl sulfate or Triton[®]-X 100 while being dependant on Claim 1.

7.1 While it may be obvious to a skilled person to employ surfactant or detergent to leach out proteins for extraction purposes, applicant finds it difficult to accept a skilled person would consider McMurtrey as a relevant art because this prior art really concerns effluent treatment whereby there is no limit as to "sample" size or source such as

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effluent, waste, groundwater, sludge and the like. In contrast, applicant's claimed invention works on small or limited sample sources such as plant parts.

- 7.2 In comparing applications, McMurtrey's technology is meant for extracting hazardous materials from such large sources while applicant's invention, in contrast, may extract hazardous materials in the form of residue pesticides, herbicides and other toxic substances in minute quantities for their presence for analysis purposes. It is obvious to a skilled person that it will take forever for an analytic extraction method such as applicant's invention to be used to extract substances from industrial effluent in the same way chromatography were to be used to clean up oil sludge at a beach head. Accordingly, a skilled person considering the applicant's invention in light of Wai would not be led to consider McMurtrey.
- 7.3 Applicant would further point out that the specific reference in McMurtrey singled out by the Examiner at column 8 lines 27 - 43 discloses a breaking of the surfactant/water microemulsion into separate immiscible streams of the surfactant and the water wherein each stream is processed separately. Such independent and separate processing of different streams or phases would not suggest to a skilled person to adapt from Wai or general state-of-the-art to arrive at applicants invention's use of specific surfactants, notwithstanding the unique pressure range of 10 - 25 bars.
- 7.4 Accordingly, applicant maintains that the claims are patentable over Wai in light of McMurtrey and the general knowledge of employing surfactant for precipitating proteins.

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CONCLUSION

8. Novelty. As commented above, the amended Claim 1 is now directed to a feature which is a pressure range of 10 - 25 bars and is novel over the prior art, including the above 3 cited art.

9. Inventive Step. There is a lack of teaching or suggestion in any one or combination of the above cited prior art documents to suggest to a person skilled in the art would be led to applicant's invention as explained in respect of each instances of alleged obviousness made by the Examiner.

10. Accordingly, applicant respectfully submits that the present invention as claimed in the amended set of claims are novelty and inventive over the prior art and acceptance of the presently amended set of claims is respectfully requested.

11. If a telephone interview would be of assistance in advancing prosecution of the subject application, Applicant's undersigned attorney invites the Examiner to telephone him at the number provided below.

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No fee other than the one hundred and twenty dollars (\$120.00) for the one-month extension of time is deemed necessary in connection with the filing of this Amendment. However, if any fee is required, authorization is given to charge the amount of any such fee to Deposit Account No. 50-1891.

Respectfully submitted,

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